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(54) Title: USES OF WHITE CORN HYBRIDS

(57) Abstract: The present invention provides hybrid white corn that produces grain with novel compositional characteristics, such as, higher endosperm protein concentration and low levels of carotenoids. The compositional changes facilitate the use of an improved process for wet milling of white corn and improve the characteristics and performance of the products derived therefrom. A high protein, nearly carotene-free corn gluten meal and substantially pure starch are extracted from this white corn having a unique genotype, a unique kernel phenotype and advantage in the wet milling process is disclosed.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/09186

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : B02B 1/04; B02C 9/00
US CL : 426/481,483

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 426/481,483

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
STN (Agricola, Biosis, CaPlus, Embase), EAST (USPAT)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 4,106,487 A (RANDALL et al) 15 August 1978 (15.08.1978), entire document.	1-16
Y	US 5,097,096 A (WILLIAMS) 17 March 1992 (17.03.1992), see entire document.	1-16

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"E" earlier application or patent published on or after the international filing date

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"O" document referring to an oral disclosure, use, exhibition or other means

"&"

document member of the same patent family

"P" document published prior to the international filing date but later than the priority date claimed

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/09186

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claim Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claim Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claim Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Please See Continuation Sheet

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.: 1-16

Remark on Protest

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

BOX II. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

Group I, claim(s), 1-16 drawn to a method of using white corn, specifically a hybrid between WEBF428C and a white corn inbred.

Group II, claim(s) 17-29, drawn to a method for wet milling white corn.

Group III, claim(s) 30-32, drawn to a method of selecting a white corn hybrid that is suitable for wet milling.

Group IV, claim(s) 33-35, drawn to a white corn foodstuff.

Group V, claim(s) 36 and 37, drawn to a method of producing a white corn end-product from a white corn seed having a grain component substantially free of β -carotene.

Group VI, claim(s) 38 and 39, drawn to a method of producing a white corn end product from a white corn seed for milling based on a protein characteristic of the endosperm of the seed.

Group VII, claim(s) 40-49, drawn to a method of making a hybrid white corn and the product of the method and methods of using the hybrid white corn plant.

Group VIII, claim(s) 50-52, drawn to a method of using white corn comprising wet milling a white corn seed on an identity preserved basis.

Group IX, claim(s) 53-56 and 58-59, drawn to a method of producing masa.

Group X, claim(s) 57, drawn to a gluten produced from wet milling white corn having a phosphorus level of less than 0.6% of said gluten.

Group XI, claim(s) 60, drawn to a white corn kernel having starch granules in the upper 25% of the kernel whereas more than 50% of said starch granules have a diameter less than 2 microns in the lower 25% of the kernel.

Group XII, claim(s) 61, drawn to a white corn kernel having starch granules in the upper 25% of the kernel whereas more than 50% of said starch granules have a diameter greater than 6 microns.

The inventions listed as Groups I-XII do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

In the instant case the method of using white corn at Group I does not require the product of the method of claim 30 (Group III) and has different method steps, different starting materials and different end products than the method of Groups II, III, V, VI, VII, VIII and IX. In addition, the products of Groups IV, X, XI and XII are compositionally and functionally distinct products. Hence, the instant claims do not relate to a single general inventive concept under PCT Rule 13.1 because the different methods and different products lack the same or corresponding special technical feature as required under PCT Rule 13.2.